Supplementary Information

Silica-coated bismuth sulfide nanorods as multimodal contrast agents for non-invasive visualization of gastrointestinal tract

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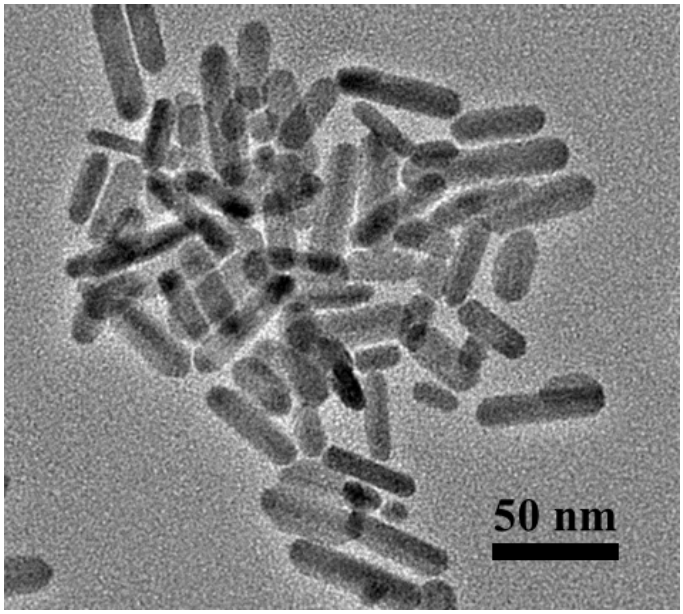

Figure S1. TEM image of as-prepared Bi_2S_3 NRs.

Figure S2. (A) Wide-angle XRD pattern of the as-prepared Bi_2S_3 NRs. Bottom in (A): the standard pattern of pure hexagonal Bi_2S_3 (JCPDS No: 43-1471). (B) XPS spectrum of as-prepared Bi_2S_3 NRs. (C) Bi 4f XPS spectrum of as-prepared Bi_2S_3 NRs. (D) FT-IR spectra of Bi_2S_3 NRs before and after modification with TPGS.

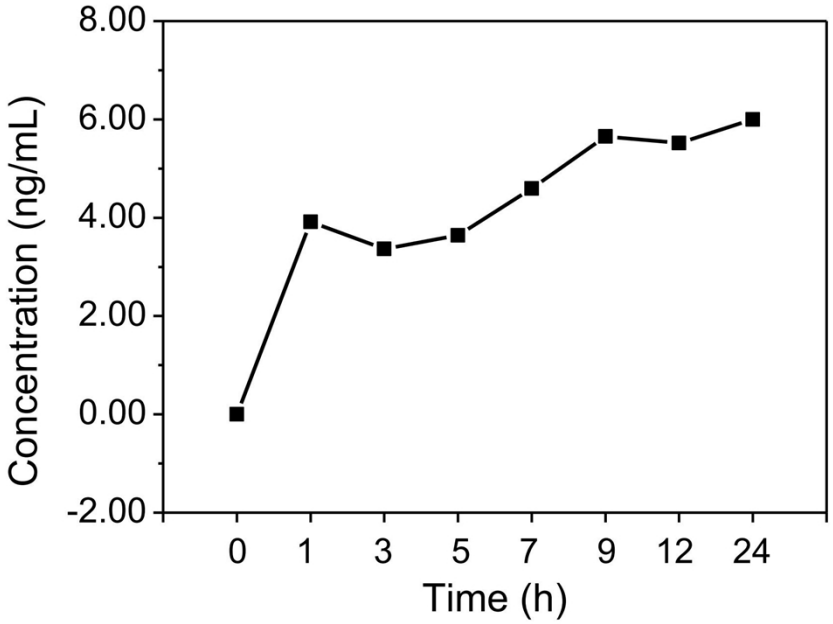

Figure S3. Cumulative bismuth ion concentration released from Bi_2S_3@SiO_2 NRs.

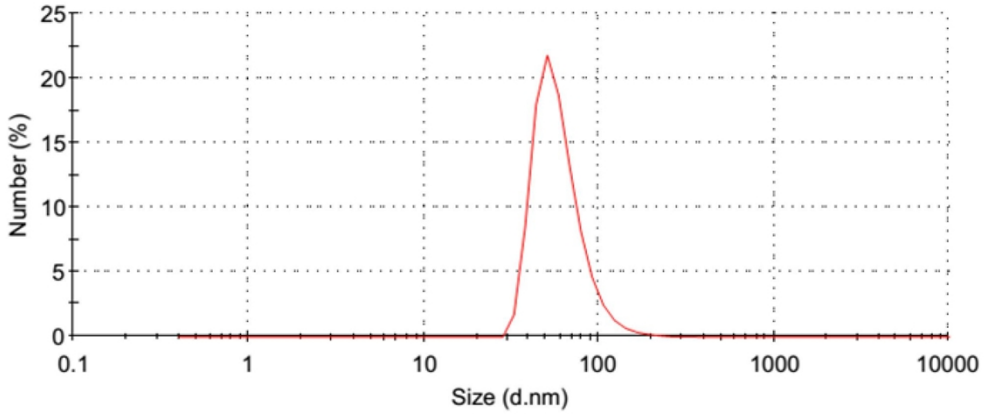

Figure S4. Dynamic light scattering figure of Bi_2S_3@SiO_2 NRs.

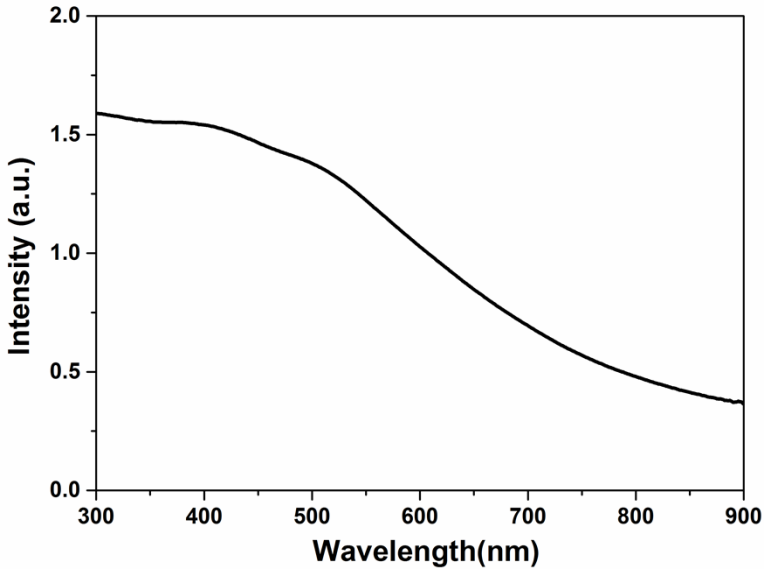

Figure S5. UV-vis-NIR absorbance spectrum of Bi_2S_3@SiO_2 NRs.

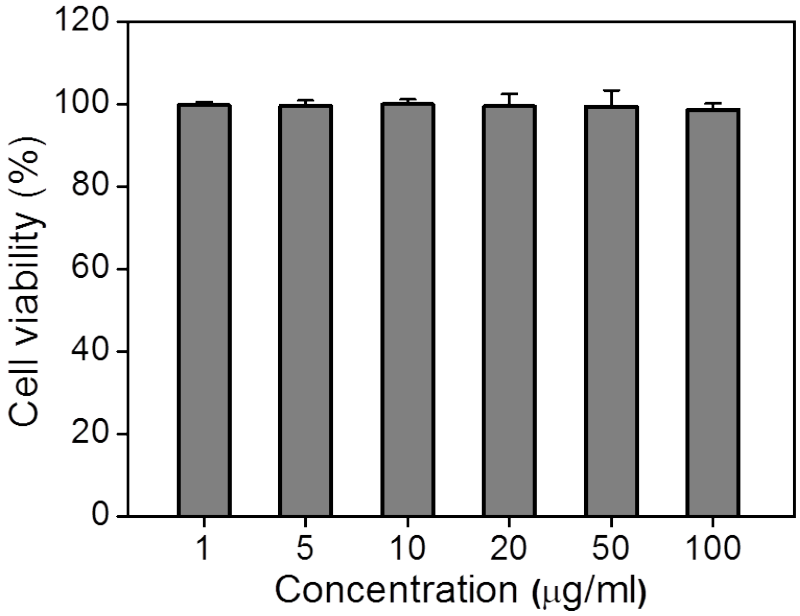

Figure S6. Cell viability of 16HBE cells after cultured with various concentrations of Bi_2S_3@SiO_2 NRs for 24 h.

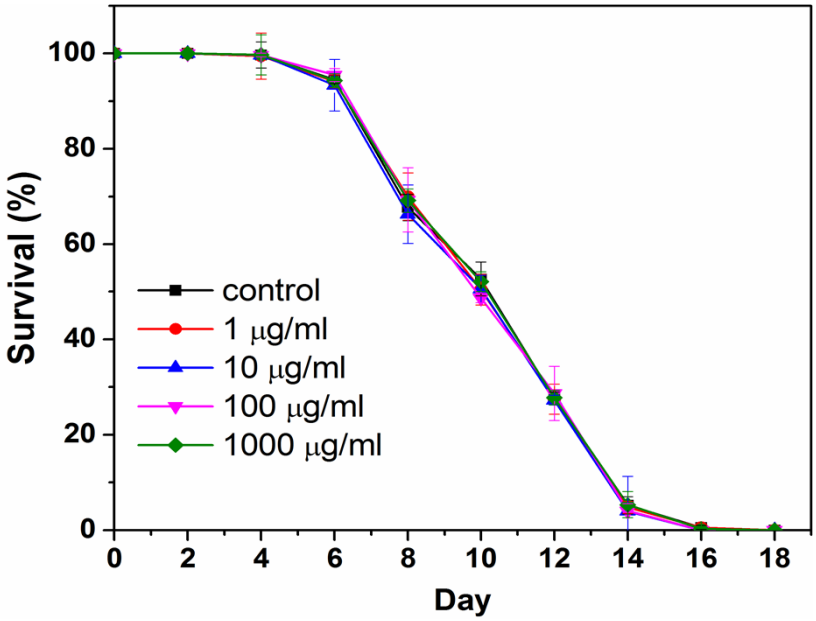

Figure S7. The lifespan curves of worms treated with FUdR-containing plates with different concentrations of Bi_2S_3@SiO_2 NRs.

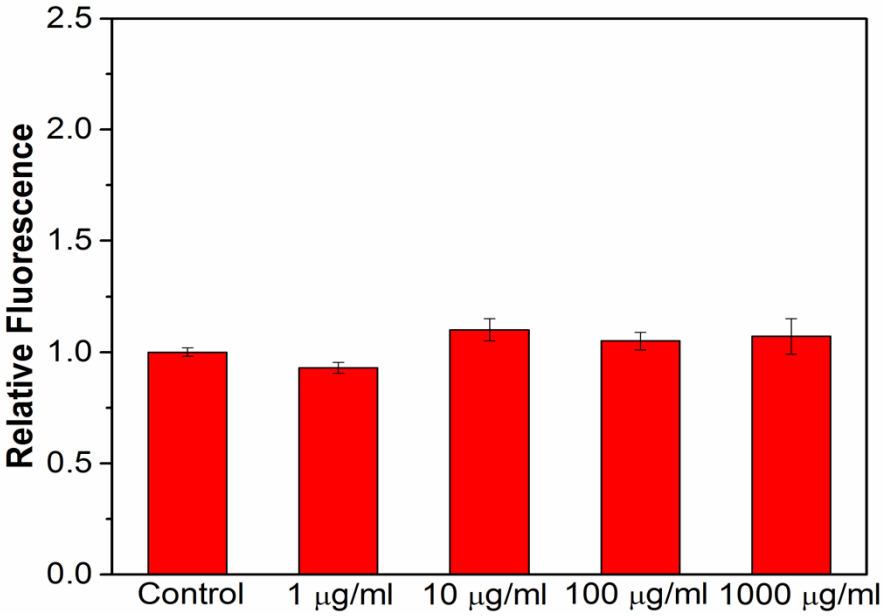

Figure S8. Effects of Bi_2S_3@SiO_2 NRs treatments on the accumulation of lipofuscin in age-synchronized worms. The intensity of fluorescence of the worms treated with different concentrations of Bi_2S_3@SiO_2 NRs relative to the control group.

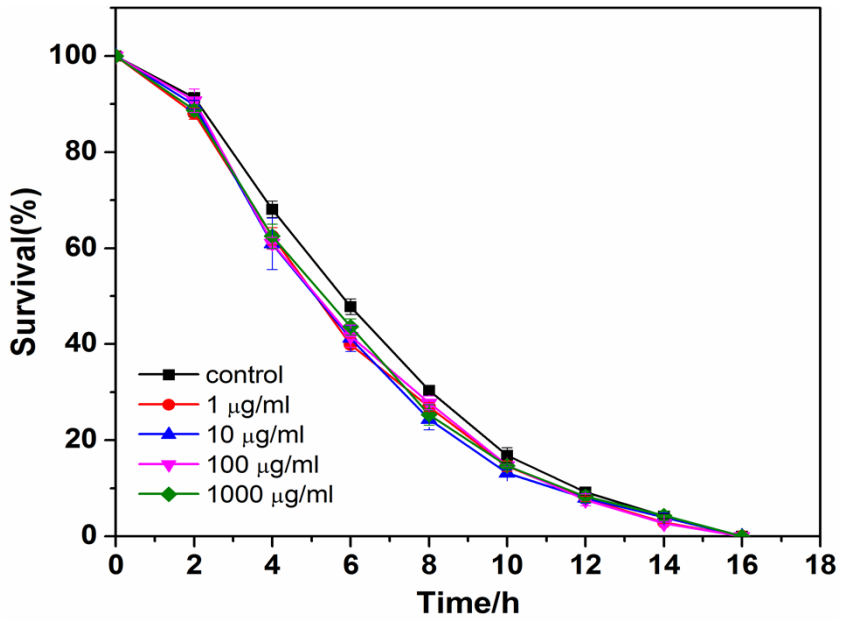

Figure S9. Effects of Bi_2S_3@SiO_2 NRs on juglone-induced oxidative stress. The lifespan curves of 3-day old worms were pretreated with NGM plates with Bi_2S_3@SiO_2 NRs and then incubated with 600 μM juglone at 20 °C.

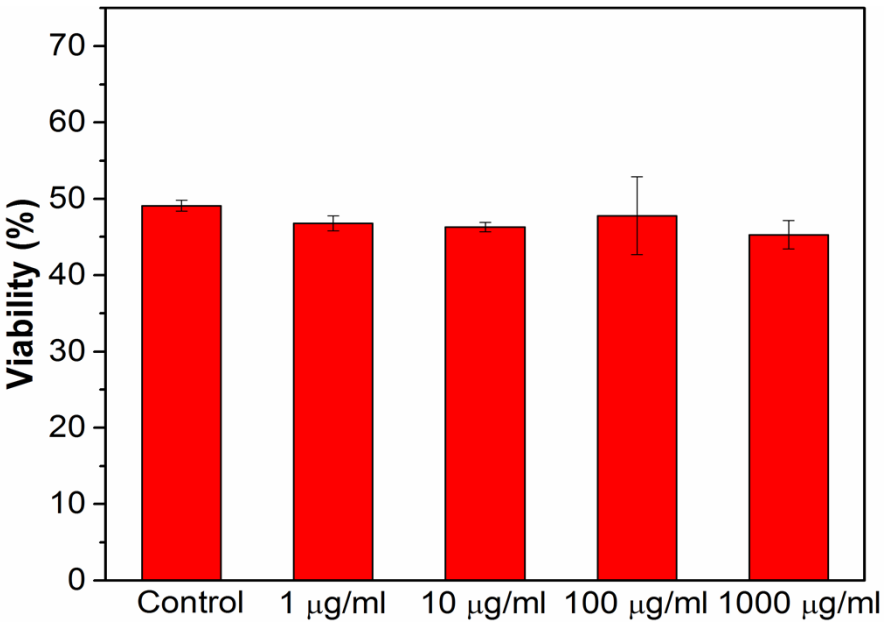

Figure S10. Effects of Bi_2S_3@SiO_2 NRs treatments on thermotolerance. The viability of 3-day old worms treated with different concentrations of Bi_2S_3@SiO_2 NRs and exposed to 35 ^oC for 10 h. The above experiments was repeated at least 3 times, data are expressed mean ± SEM.

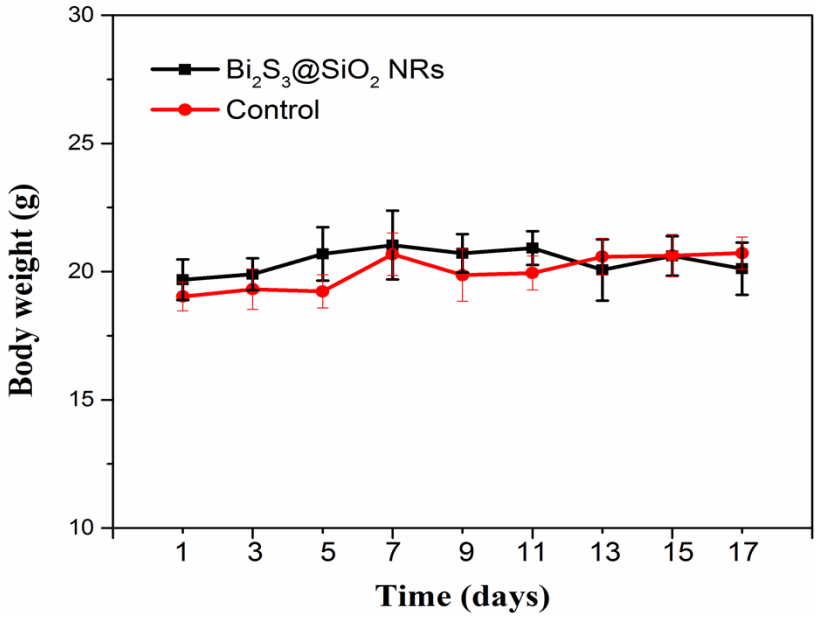

Figure S11. BALB/c mice were used to test the *in vivo* toxicity of Bi_2S_3@SiO_2 NRs. The 300 μL of Bi_2S_3@SiO_2 NRs (10 mg/mL) which dispersed in physiological saline were orally delivered to mice (the number of mice in each group is 3) and the weights of mice are recorded at several time-points. The control group was received same volume of physiological saline in the same way.

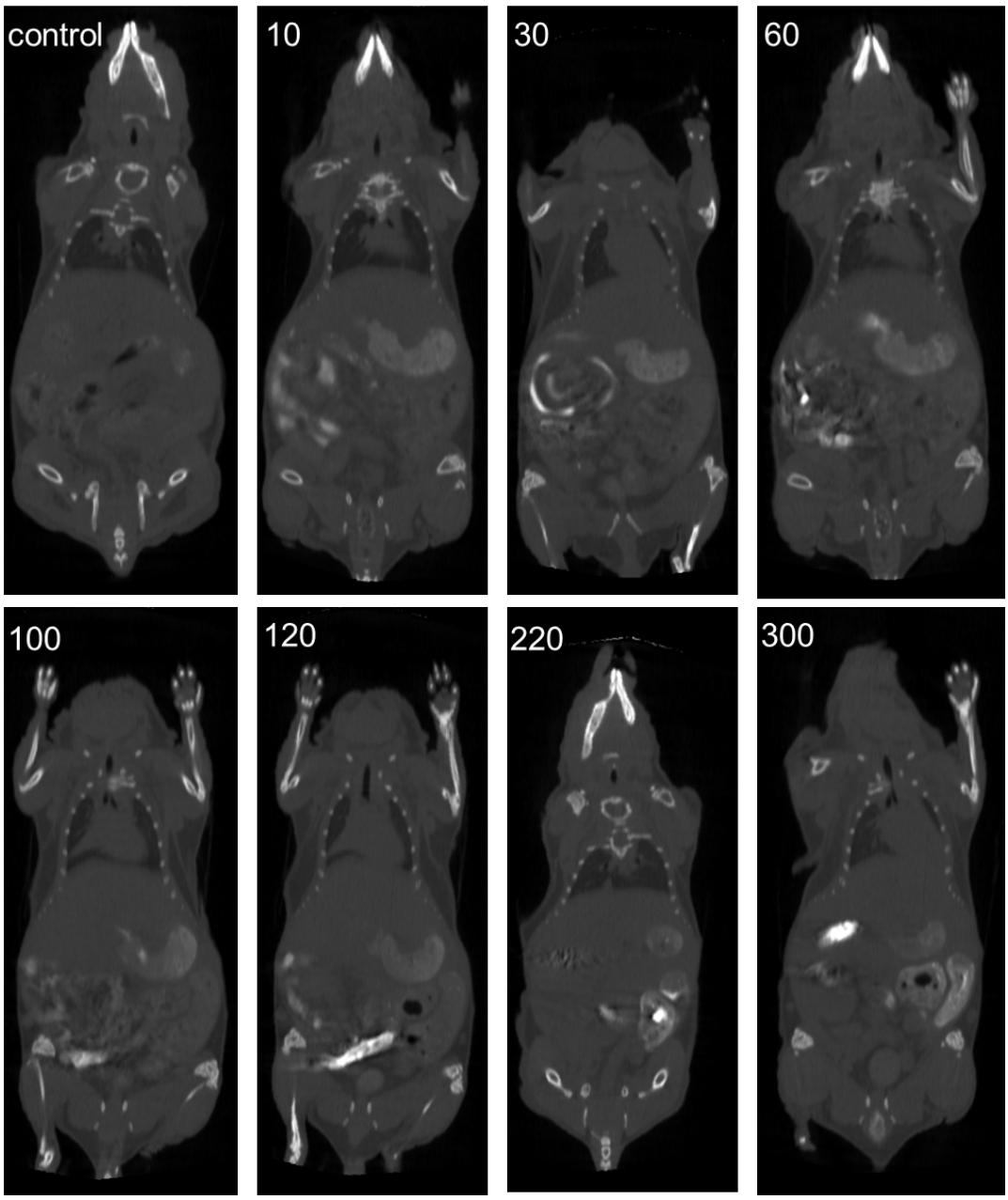

Figure S12. *In vivo* CT coronal views of intestine in BALB/c nude mice at different intervals after oral administration of Bi_2S_3@SiO_2 NRs.

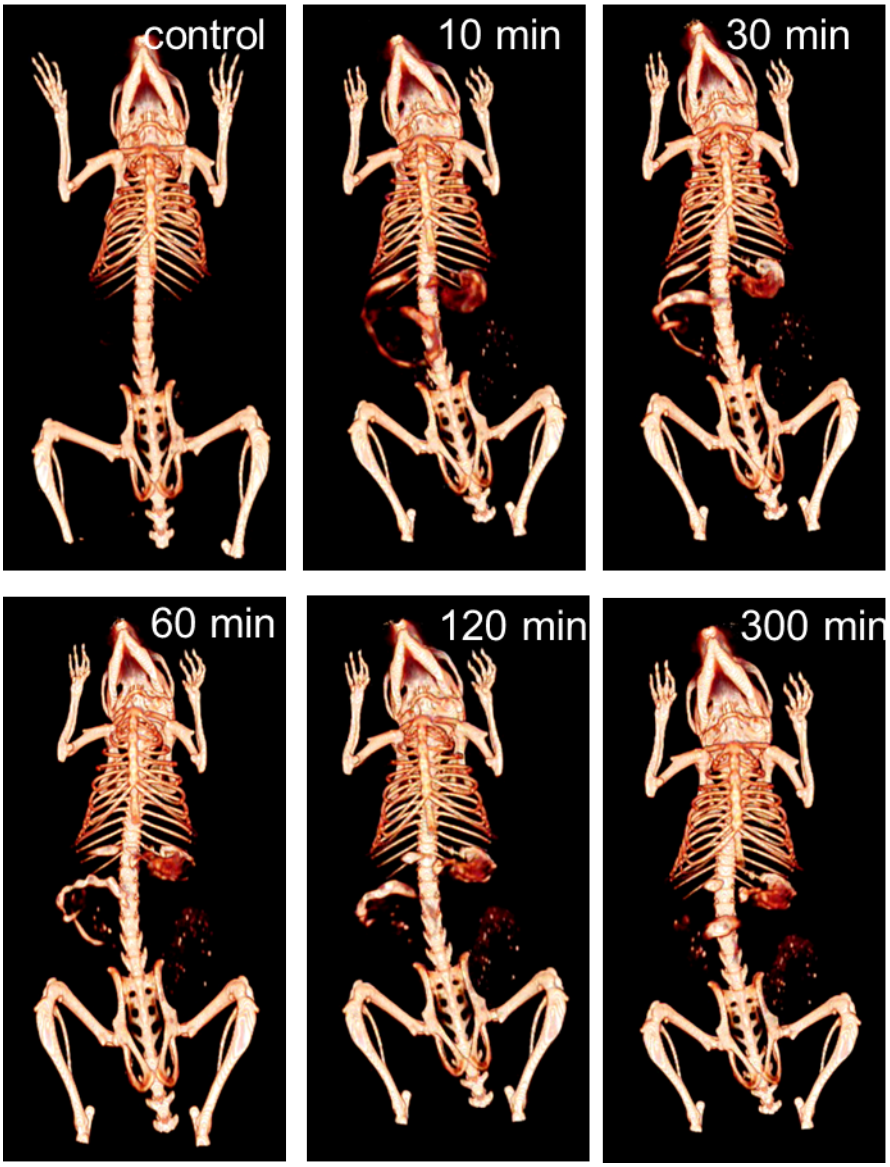

Figure S13. *In vivo* CT imaging of GI tract in BALB/c nude mice at different intervals after oral administration of barium sulfate dispersion.